

APPLICATION UNDER UNITED STATES PATENT LAWS

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Invention: MOBILE STATION WITH A PLURALITY OF INTERFACES

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This is a:

- ☐ Provisional Application
- ☐ Regular Utility Application
- ☐ Continuing Application
☒ The contents of the parent are incorporated by reference
- ☒ PCT National Phase Application
- ☐ Design Application
- ☐ Reissue Application
- ☐ Plant Application
- ☐ Substitute Specification
Sub. Spec Filed _____
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- ☐ Marked up Specification re
Sub. Spec. filed _____
In App. No. _____ / _____

SPECIFICATION

Ins A17

Year	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

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The British patent application GB-A-2 289 555 specifies a "notebook" computer with a memory unit that does not use the free memory in the CPU of the notebook. Part of the application and word processor programs of the notebook computer are stored in the memory unit. The notebook computer does not communicate externally with devices that lack an external processor as an interface, with the exception of devices that do not require their own processor, with applications software included in the CPU memory of a mobile station.

Summary of the invention

The present invention relates to a method and a mobile station for the use of the CPU memory of a mobile station as interface for a plurality of applications that are external to the mobile station according to the attached independent claims and further embodiments according to the attached dependent claims.

One intention of the present invention is to specify a mobile station that has been customized for communication with units that are external to the mobile station directly from the CPU, without using an external CPU as interface for the communication.

In particular, the invention specifies a method for using the CPU memory of a mobile station as interface for a plurality of applications that are external to the mobile station. Program modules for the said external applications are stored in that part of the CPU memory of the mobile station that is available after that the software that controls the conventional functions of the mobile station has been stored. The CPU of the mobile station thus performs those functions that connect external devices to the radio section of the mobile station and thus replaces a conventional external CPU as interface between external devices and the mobile station.

In one embodiment of the invention the input- and output ports of the mobile station are connected directly to the input- and output ports of the external device, via cable or in a wireless manner, whereby the mobile station is not continuously locked into an external device.

In another embodiment the CPU has an interface to each external device and its application.

A further embodiment of the invention includes the case in which one of the external devices is a position-determining device, for determining the position of the mobile station.

Another embodiment includes the case in which one of the external devices is a measuring device for measurement of at least one measurable parameter.

A further embodiment includes the case in which one of the external devices is a navigation device for navigation of a vehicle or person.

Furthermore, the invention in one embodiment includes the case in which one of the external organs is an alarm for generating an alarm concerning a condition that requires an alarm.

A further embodiment includes the case in which one of the external devices is a monitoring device for, for example, machines or a machine park.

A further embodiment includes the case in which the external organs are customized with customized applications program modules, whereby they have been determined by the user of a mobile telephone and programmed in during ordering of the mobile station, and whereby tailoring of the mobile station is achieved according to the needs of the customer.

Furthermore, the applications program modules of the external devices can be erased and replaced by new applications program modules that are specific for the customer by reprogramming of free modules in an embodiment of the invention.

Furthermore, the present invention specifies a mobile station with its own CPU memory as interface to a plurality of applications that are external to the mobile station. The mobile station in this case includes:

program modules in the CPU memory for the said external applications, which are stored in that part of the CPU memory of the mobile station that is available after that the software that controls the conventional functions of the mobile station has been stored; and

that the CPU performs those functions that connect external devices to the radio section of the mobile station and thus replaces a conventional external CPU as interface between external devices and the mobile station.

Further, the mobile station can, according to the present invention, perform those embodiments that are specified in the method described above.

Brief description of the drawing

Henceforth reference is had to the attached drawings and the explanatory text in order to obtain a better understanding of the invention and its embodiments, whereby:

Fig. 1 illustrates schematically an embodiment of previously known technology concerning an example using GPS positioning; and

Fig. 2 illustrates schematically an embodiment according to the present invention with the example shown in Fig. 1.

Preferred embodiments of the described invention

The invention according to the present description is intended to solve the problems related to interfaces for the use of external devices, such as GPS devices, alarm devices, monitoring devices, measurement devices, etc., that make use of a mobile telephone in order

to send messages to a central or similar. A previously known system is illustrated in Fig. 1 for the positioning of, for example, a vehicle, animal or person. Fig. 1 illustrates schematically an embodiment of previously known technology concerning an example using GPS positioning. The system consists of a mobile station (MS) 10 that sends messages concerning the position of the bearer of the system using position information that is obtained through a GPS satellite receiver 14 with a receiving aerial 16.

In order to be able to use the mobile station 10 for radio messages, via, for example, GSM, about the position of a bearer of the same, the GPS receiver must have an interface in the form of a microprocessor 12 to the radio section of the MS 10, so that data from GPS are correctly transmitted over GSM.

Fig. 2 illustrates schematically an embodiment according to the present invention of the GSM example shown in Fig. 1.

With reference to Fig. 2 according to the present invention, the problem concerning an extra microprocessor 12 between an external device 14 and the MS 10 is solved using the insight that the CPU (Central Processor Unit) of MS 10 should be most suitable to be used as interface between external devices 14 and the radio section 20 of MS 10. The problem is solved by using the internal memory of about 1 MB of the CPU, approximately 700 KB of which are used for the telephony and/or data part of MS 10. The invention in itself is not limited concerning the size of the memory.

Most external applications according to the above require around 50 KB of memory in order to be able to serve as applications program modules, that is, computer programs that function as interfaces between the radio section 20 of MS 10 and external devices 14.

In theory, 300 KB provides space for six applications program modules.

During manufacture of MS 10 according to the present invention, an IC circuit 18 from, for example, the company Commquest® be used. The circuit consists of a number of modules, in this case six, whereby one module provides a CPU that can be programmed for mobile telephony. Further, one module provides an I/O interface for communication with the surroundings of MS 10. A further applications program module denoted VOC (Voice Coder) provides the voice coder of the mobile telephone. One module is denoted A/D and provides an analogue/digital converter.

Fig. 2 also shows two extra modules without description, which can be used as applications program modules for external devices. The one module here is, schematically shown, connected to the radio part 20 of MS 10 in order to report the position of MS 10 to a central.

According to the present invention, the problem concerning an extra microprocessor 12 between the radio section 20 of MS 10 and external devices 14 is solved such that the input- and output ports of the mobile station can be connected directly to the input- and output ports (not shown) of the device 14. In the same way can the CPU of MS 10 have an interface to each external device and its application as long as available memory capacity in MS 10 allows this.

Furthermore, certain preferred embodiments of the present invention consist of that one of the external devices is a position-determining device 14 in order to determine the position of the mobile station 10, measurement devices for measurement of at least one measurable parameter, navigation devices for the navigation of a vehicle or a person, alarms for generating an alarm concerning a condition that requires an alarm, monitoring devices for monitoring, etc. For example, the measuring device may consist of a reader of the electricity consumption of a domicile, whereby MS 10 transmits the reading to an electrical distributor. The alarm may be an intrusion alarm with motion detector that transmits via MS 10 to an alarm central, for example, the police, in the event of an intrusion. The monitoring device may, for example, monitor the functioning of a machine or machine park in order to send messages concerning the settings of various parameters of these, and for further transmission of the parameters to a operations centre via MS 10. According to the same method, the navigation device can be used in order to specify the course information of a vehicle on a display.

The present invention is not in any way limited by the specified applications, rather a plurality of other applications that require transmission by MS 10 are possible.

The external devices 14 have hereby been achieved as specific for a customer, with customized applications, whereby they have preferably been determined and ordered by a user of MS 10, and thus programmed in during ordering of the mobile station. Tailoring of MS 10 has in this way been achieved according to the needs of the user. The applications of the external devices can even be deleted in the CPU, and replaced by new customer-specific applications program modules by programming of the available or deleted [space].

The mobile station MS 10 according to the present invention with its own CPU memory as interface 18 for a plurality of applications that are external to the mobile station includes in addition to telephony and/or computer functions that are customary for MS 10 also:

Application program modules 18 in the CPU memory for the said external applications, which are stored in that part of the CPU memory of the mobile station that is

available after that the software that controls the conventional functions of the mobile stations has been stored; and

that the CPU performs those function that connect external devices 14 to the radio section 20 of the mobile station, and thus replaces the conventional external CPU 12 as interface 18 between the external device 14 and the mobile station 10.

The CPU in one embodiment is an IC circuit 18 that includes a fixed number of modules for external applications.

The invention also allows that the mobile telephone is connected by wire or in a wireless manner via interface 18 to different external devices as required for measurement, alarm, monitoring, navigation, positioning, etc., depending on the applications program modules, which means that MS 10 does not need to be continuously locked to one external device. In this way, the area of application of MS 10 becomes very versatile and flexible. As previously discussed, a user can then use MS 10 as a mobile telephone, electrical meter reader, navigation aid, etc., without locking its use.

The present invention has been described by the use of preferred embodiments and examples, but is not limited to these because of this. It is rather the attached claims that specify further embodiments for one skilled in this technical field.
